REMARKS

In response to the Examiner's Action mailed November 30, 2001, Applicants amend their application and request reconsideration. In this Amendment, no claims are cancelled and claims 17-22 are added so that claims 1, 3-7, 9-13, 15, and 17-22 are now pending.

The newly added claims are fully supported by the application as filed, particularly in the description of Figures 3A and 3B and by those figures. These same figures and the related description likewise support the amendments of the previously examined claims.

Claims 1, 3-7, 9-13, and 15 were rejected pursuant to 35 USC 112, first paragraph, as not enabled. The Examiner asserted that claims 1, 7, 13, and 15 needed to explain that the positive collector is aluminum rather than metal in order to conform to the disclosure. That amendment has been made, overcoming the rejection, but it is apparent that those of skill in the art would understand alternative metals within the spirit of the invention can be employed and would be equivalent.

All examined claims were rejected as either anticipated by or obvious in view of Fauteux et al. (U. S. Patent 4,925,752, hereinafter Fauteux). This rejection is respectfully traversed as to the claims examined and as to the claims now presented.

Turning first to claim 7 and its dependent claims 9-12, claims 7, 9, and 11 were rejected as anticipated and claims 10 and 12 were rejected as obvious. The rejection of claims 10 and 12 cannot be maintained if the anticipation rejection of claim 7 is erroneous.

Claim 7 is directed to a lithium polymer battery including a positive collector comprising a metal, now stated to be aluminum, and a negative plate including a negative collector *consisting of* a copper foil free of holes. As described below, Fauteux does not describe any battery structure, much less a lithium polymer battery in which any current collector is simply copper. Thus, the prior art rejection of claims 7 and 9-12 cannot be maintained.

Applicants readily acknowledge the cited portion of Fauteux at column 2 mentioning an alkaline metal anode that comprises a lithium foil, a lithium coated metal foil, or a lithium alloy. Obviously, with respect to this embodiment described by Fauteux, lithium is an essential component, clearly distinguishing from the invention as defined by examined claims 7, 9-12, and 15 as well as by all claims now pending. The lithium foil and the coated metal foil described in that passage of Fauteux as well as referred to in column 3, lines 63-66, of Fauteux , where use of copper as a substrate is mentioned, still does not either meet nor suggest these claims. Applicants also acknowledge that in the paragraph beginning in column 5, line 46, of Fauteux, there is a list of "useful collector substrates having a plurality of surface voids" that mentions both copper and aluminum. However, is it apparent from reading the complete paragraph that those substrates are not the collector itself. Rather, the collectors described and taught by Fauteux are complex and include those substrates only after various surface coatings and treatments that clearly distinguish from the invention described and claimed in the present patent application.

Examined claim 15 likewise described a lithium polymer battery including a plurality of bi-cells in which each of the bi-cells includes a negative plate with a negative collector *consisting of* a copper foil free of holes. Again, since Fauteux fails to disclose an important limitation of this claim, it cannot anticipate nor even suggest this claim.

Newly added claims 17-22 are likewise directed to lithium polymer battery structures in which the negative collector *consists of* a copper foil free of holes. For the same reasons already stated, those claims are clearly patentable over Fauteux .

Amended claim 1 and its dependent claims 3-6 cannot be anticipated by nor suggested by Fauteux because Fauteux fails to describe a lithium polymer battery including a positive plate *consisting of* aluminum. For the same reason, claim 13 is patentable over Fauteux.

Even if Fauteux had disclosed or suggested the plate materials of the claims, it would not suggest the claimed invention. In the invention, it is the positive collector that includes a plurality of openings, openings that penetrate through that collector. As described in the patent application, the positive active material, ultimately applied to that positive collector either directly as a slurry or after the formation of a sheet from the slurry, includes a plasticizer. The plasticizer is later extracted, leaving interstices that are

essential to the intercalation processes that provide the electrochemical activity of the battery. The plasticizer is removed with a solvent that is able to reach the active materials more efficiently in the invention than with a solid collector, since the positive collector includes penetrating openings. This improvement in performance is described in the patent application and supported by experimental evidence. While Applicants do not disagree that at least some of the current collectors in Fauteux include "surface voids', the purpose of those voids is to increase electrical contact between the active material, i.e., to reduce cell impedance. The surface voids have no role in improving the efficiency of plasticizer extraction and, for that reason, a person of skill in the art would not find a suggestion in Fauteux for the invention as now claimed.

Reconsideration, withdrawal of the rejection, and prompt issuance of a Notice of Allowance are earnestly solicited.

Respectfully submitted,

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

CHANG et al.

Application No.:	09/416,270	Art Unit:	1745
Filed:	October 12, 1999	Examiner:	T. Dove
For:	LITHIUM POLYMER BATTERY		

SPECIFICATION, CLAIMS, AND ABSTRACT AS AMENDED IN RESPONSE TO THE OFFICIAL ACTION MAILED NOVEMBER 30, 2001

Amendments to existing claims:

1. (Fourth Amendment) A lithium polymer battery comprising:

a positive plate including a positive collector ~~comprising a metal~~, consisting of aluminum having a plurality of openings, and a positive active material layer on at least one surface of the ~~positive collector~~ aluminum;

a negative plate including a negative collector, comprising a copper foil free of holes, and a negative active material layer on at least one surface of the ~~negative collector~~ copper foil; and

a separator located between the positive and negative plates, insulating the positive and negative plates from each other.

3. (Twice Amended) The lithium polymer ~~batter~~ battery of claim 1, wherein the positive collector is expanded ~~metal~~ aluminum.

5. (Amended) The lithium polymer battery of claim 1, wherein the positive collector is punched ~~metal~~ aluminum.

7. (Twice Amended) A lithium polymer battery comprising:

a positive plate including a positive collector, comprising ~~a metal~~ aluminum having a plurality of openings, and a positive active material layer on at least one surface of the ~~positive collector~~ aluminum;

a negative plate including a negative collector, consisting of a copper foil free of holes, and a negative active material layer on at least one surface of the ~~negative collector~~ copper foil; and

a separator located between the positive and negative plates, insulating the positive and negative plates from each other.

9. (Amended) The lithium polymer battery of claim 7, wherein the positive collector is expanded ~~metal~~ aluminum.

10. (Amended) The lithium polymer battery of claim 7, wherein the positive collector is punched ~~metal~~ aluminum.

13. (Twice Amended) A lithium polymer battery comprising a plurality of bi-cells stacked on each other, wherein each bi-cell comprises

a positive plate including a positive collector ~~comprising a metal~~, consisting of aluminum having a plurality of openings, a positive active material layer on both surfaces of the ~~positive collector~~ aluminum, and a positive tap electrically connected to the positive collector;

a negative plate including a negative collector, comprising a copper foil free of holes, a negative active material layer on both surfaces of the ~~negative collector~~ copper foil, and a negative tap electrically connected to the ~~negative collector~~ copper foil; and

a separator located between the positive and negative plates, insulating the positive and negative plates from each other, wherein the positive taps of the bi-cells are connected together as a first terminal of the battery and the negative taps of the bi-cells are connected together as a second terminal of the battery.

15. (Twice Amended) A lithium polymer battery comprising a plurality of bi-cells stacked on each other, wherein each bi-cell comprises

a positive plate including a positive collector, comprising ~~a metal~~ aluminum having a plurality of openings, a positive active material layer on both surfaces of the ~~positive collector~~ aluminum, and a positive tap electrically connected to the ~~positive collector~~ aluminum;

a negative plate including a negative collector, consisting of a copper foil free of holes, a negative active material layer on both surfaces of the ~~negative collector~~ copper foil, and a negative tap electrically connected to the ~~negative collector~~ copper foil; and

a separator located between the positive and negative plates, insulating the positive and negative plates from each other, wherein the positive taps of the bi-cells are connected together as a first terminal of the battery and the negative taps of the bi-cells are connected together as a second terminal of the battery.

Add the following claims:

17. (New) The lithium polymer battery of claim 1, wherein the negative collector consists of the copper foil free of holes.

18. (New) The lithium polymer battery of claim 17, wherein the positive collector is expanded aluminum.

19. (New) The lithium polymer battery of claim 17, wherein the positive collector is punched aluminum.

20. (New) The lithium polymer battery of claim 17, wherein the positive and negative active material layers are coatings of positive and negative active material slurries, respectively, on at least one surface of the positive collector and at least one surface of the negative collector, respectively.

21. (New) The lithium polymer battery of claim 17, wherein the positive plate includes the positive active material layer on both sides of the positive collector and the negative plate includes the negative active material layer on both sides of the negative collector.

22. (New) The lithium polymer battery of claim 13, wherein the negative collector consists of the copper foil free of holes.